

Issue no. 02/2023

Characteristic features of electric air conditioning compressors

*Please pay special attention to the following points when servicing and replacing electric air conditioning compressors.*

#### **Air conditioning compressors for electric and hybrid vehicles**

Air conditioning compressors for electric and hybrid vehicles differ from belt-driven models in many ways. Here are a few important points to consider when servicing and repairing them. Electrically driven compressors are hermetically sealed. The absence of a drive shaft for the belt drive means that refrigerant cannot escape via the shaft seals. The electric motor for the drive is located within the compressor housing. Since the motor comes into contact with refrigerant and refrigerant oil, only oil with insulating properties may be used. There is a risk of short circuit if moisture enters the refrigerant circuit. PAO multigrade oils are therefore preferred due to their nonhygroscopic properties (see TM 04/2022).

However, you should always follow the vehicle manufacturer's specifications when selecting the refrigerant and compressor oil. Choosing the correct refrigerant oil as well as regular air conditioning services are crucial to the safe operation of electric air conditioning compressors.

#### **Replacing e-compressors**

Only those certified to work on high-voltage systems may replace electric air conditioning compressors. The points below should be observed to avoid expensive consequential damage.

Electric compressors generally do not have an oil drain plug, so it is not possible to adjust the system oil quantity via the compressor. The air conditioning system must therefore be flushed before installing a new compressor. This is the only way to ensure that the system is free of oil residues and to avoid overfilling. All nonflushable components must be replaced, as must the drier (see TM 08/2021).

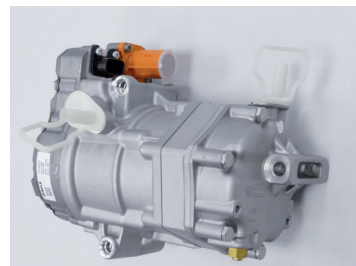


Figure 1: Electric air conditioning compressor



Figure 2: PAO multigrade oil

#### **Important!**

Many vehicle manufacturers use special programs when commissioning a new air conditioning compressor. By means of a diagnostic tester, these programs ensure a slow start-up and thus prevent a sudden intake of compressor oil from causing consequential damage (hydraulic shock).